

CLAIMS

1. An oxygen concentrating apparatus for generating oxygen enriched gas by adsorbing and separating nitrogen gas from air, comprising:

5 an oxygen concentrator having an adsorption cylinder filled with adsorbent for adsorbing nitrogen gas, also having an air inlet port, an oxygen outlet port and a nitrogen gas outlet port;

10 a compressor for supplying compressed air from the air inlet port;

a sound insulation box, which surrounds the compressor, for reducing noise generated from the compressor, ribs being formed on a side wall of the sound insulation box;

15 a cooling fan for introducing air into the sound insulation box so as to cool the compressor by the introduced air;

a housing surrounding the oxygen concentrator and the sound insulation box; and

20 an exhaust duct arranged in the housing, for guiding the exhaust discharged from the cooling fan to the outside of the housing.

2. An oxygen concentrating apparatus according to claim 1, wherein the rib is diagonally provided on a side wall of the sound insulation box.

25 3. An oxygen concentrating apparatus according to claim 2, wherein a horizontal partition wall is provided in the sound insulation box, an inner space of the sound insulation box is divided into an upper and a lower space by the partition wall, the compressor is set on an upper face of the partition wall in the upper space, and the cooling fan is attached to an upper portion of the compressor in the upper space.

30 4. An oxygen concentrating apparatus according to claim 3, wherein an air inlet opening is formed on the side wall at a position lower than the partition wall.

5. An oxygen concentrating apparatus according to

claim 4, wherein the compressor includes a suction pipe which penetrates the partition wall so that the suction pipe can be communicated with the lower space.

5       6.    An oxygen concentrating apparatus according to claim 5, wherein the partition wall includes a cooling air passage for communicating the upper space with the lower space, a portion of the air in the lower space flows into the upper space via the cooling air passage so as to cool the compressor, and the air is discharged  
10   outside the housing via the exhaust duct by the cooling fan.

      7.    An oxygen concentrating apparatus according to claim 3, wherein a nitrogen gas outlet port of the oxygen concentrator is communicated with an upper space of the  
15   sound insulation box.

      8.    An oxygen concentrating apparatus according to claim 1, wherein an air inlet is formed on the side wall of the housing, an exhaust port is formed on the bottom wall of the housing, and the exhaust duct is communicated  
20   with the exhaust port.

      9.    An oxygen concentrating apparatus according to claim 8, wherein an electric control unit for controlling the compressor, the cooling fan and the oxygen concentrator is attached to an inner face of a top wall  
25   of the housing, and a deflecting plate, which makes the air flowing from the air inlet into the housing flow toward the electric control unit, is arranged in the housing.

      10.   An oxygen concentrating apparatus according to claim 8, wherein the exhaust duct includes a hollow outer shell composed of a substantially L-shaped hollow member having a horizontal portion and a perpendicular portion connected to one end portion of the horizontal portion via one bend section and also includes a sound absorbing  
30   member of 2 to 20 mm thickness which is stuck onto an  
35   inner face of the outer shell,

          the other end of the horizontal portion of

the outer shell is communicated with an air outlet of the cooling fan, a lower end of the perpendicular portion of the outer shell is arranged in the housing so that it can be communicated with the exhaust port, and the cross-sectional area of the outer shell is 12 to 20 cm<sup>2</sup> and the length of the outer shell is 350 to 450 mm.

11. An oxygen concentrating apparatus for generating oxygen enriched gas by adsorbing and separating nitrogen gas from air, comprising:

10                    an oxygen concentrator having an adsorption cylinder filled with adsorbent for adsorbing nitrogen gas, also having an air inlet port, an oxygen outlet port and a nitrogen gas outlet port;

15                    a compressor for supplying compressed air from the air inlet port;

                    a sound insulation box, which surrounds the compressor, for reducing noise generated from the compressor, ribs being formed on a side wall of the sound insulation box;

20                    a cooling fan for introducing air into the sound insulation box so as to cool the compressor by the introduced air;

                    a housing surrounding the oxygen concentrator and the sound insulation box; and

25                    an exhaust duct arranged in the housing, for guiding the exhaust discharged from the cooling fan to the outside of the housing, wherein

                    the exhaust duct includes a hollow outer shell having a horizontal portion and a perpendicular portion, which is connected to one end portion of the horizontal portion via one bend section so that the hollow outer shell can be extended into a substantial L-shape, and also includes a sound absorbing member of 2 to 20 mm thickness which is stuck onto an inner face of the hollow outer shell, the other end portion of the horizontal portion of the hollow outer shell is  
35                    communicated with an outlet of air of the cooling fan, a

lower end portion of the perpendicular portion is arranged in the housing so that it can be communicated with the exhaust port, and a cross sectional area of the exhaust duct is 12 to 20 cm<sup>2</sup> and the length of the exhaust duct is 350 to 450 mm.

12. An oxygen concentrating apparatus according to claim 11, wherein a horizontal partition wall is arranged in the sound insulation box, an inner space of the sound insulation box is divided into an upper space and lower space, the compressor is set on an upper face of the partition wall in the upper space, and the cooling fan is attached in an upper portion of the compressor.

13. An oxygen concentrating apparatus according to claim 12, wherein an air inlet opening is formed at a position lower than the partition wall on the side wall of the sound insulation box.

14. An oxygen concentrating apparatus according to claim 13, wherein the compressor includes a suction pipe penetrating the partition wall so that the suction pipe can be communicated with the lower space.

15. An oxygen concentrating apparatus according to claim 14, wherein the partition wall includes a cooling air passage for communicating the upper space with the inner space, and a portion of the air in the lower space flows into the upper space via the cooling air passage and cools the compressor and is discharged by the cooling fan to the outside of the housing via the exhaust duct.

16. An oxygen concentrating apparatus according to claim 13, wherein a nitrogen gas outlet port of the oxygen concentrator is communicated with the upper space of the sound insulation box.

17. An oxygen concentrating apparatus according to claim 11, wherein an air inlet is formed on the side wall of the housing, an exhaust port is formed on the bottom wall of the housing, and the exhaust duct is communicated with the exhaust port.

18. An oxygen concentrating apparatus according to

claim 11, wherein an electric control unit for controlling the compressor, the cooling fan and the oxygen concentrator is attached onto the inner face of the top wall of the housing, and

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a deflecting plate for making the air, which has flowed from the air inlet into the housing, flow toward the electric control unit is arranged in the housing.